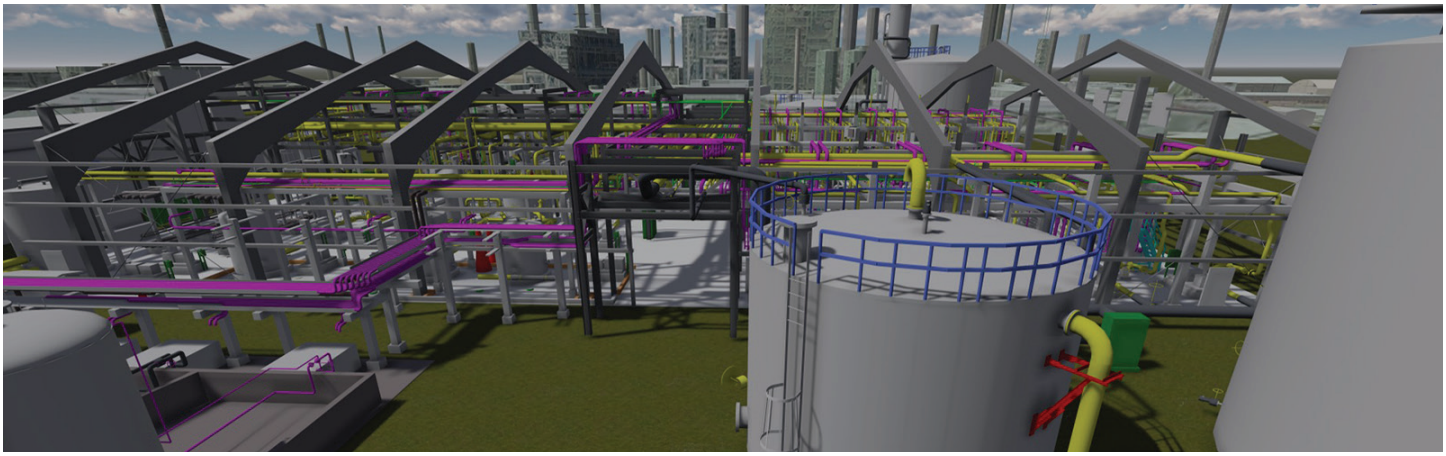
CASE STUDY

Implementing a Sustainable Water Treatment Solution

An oil field brine intrusion jeopardized the fresh water supply for a Midwest community and refinery. In order to address the water threat, a new wastewater reclamation process was essential.



Challenge

When a Midwest oil field intrusion threatened the supply of fresh water for a community, a local refinery sought to find an alternative water supply. Additionally, for many years, the refinery utilized temporary microfiltration and reverse osmosis membrane treatment units for issues associated with degrading water quality.

The refinery reached out for help in implementing a solution to the water challenges that were affecting it and the surrounding communities.

Project Stats

Client
Confidential

Location
Midwest

Completion Date
2015

2,300
GPM cooling system

1,500
GPM boiler system

Solution

The refinery engaged our team to plan and design a wastewater reclamation process to reduce withdrawal of raw water from an aquifer. This included piloting membranes to evaluate scaling, transmembrane pressures and long-term operational costs.

The facility includes multiple cooling water towers and a boiler system for steam production. Both systems require treatment before water use. Piping and valving were designed to allow the refinery to manage the water sources and to use higher quality raw water sources for the boiler feed systems and the lower-quality sources for the cooling water.

Several water sources are now blended and routed to the new treatment facility. The water for the boiler feed system includes chloride remediation wells and fresh groundwater wells. The water for the cooling tower consists of fresh groundwater, secondary domestic effluent and refinery wastewater.

The cooling water system was designed for a permeate future capacity of 2,300 gpm, while the boiler water feed system was designed to deliver 1,500 gpm of permeate.

Other project features include a 4,800-square-foot building for electrical service, operations and instrumentation, and an associated 10/11.2 MVA substation with four transformers.

Results

By reusing waste streams and maximizing water recovery, the project goal of developing a long-term solution to a regional water concern most significant results of the project included water conservation and a reduced environment impact.

Additionally, the refinery was able to reduce costs by implementing a more permanent solution to the water quality challenges in the area.

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